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405 S. Highway 121 (Bypass)
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8 February 2016

Mr. Gary Miller
Task Order Monitor
U.S. Environmental Protection Agency (EPA)
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

RE: Data Validation Report, Revision 00
San Jacinto River Waste Pits Superfund Site
Remedial Investigation/Feasibility Study Oversight
EPA Region 6 Remedial Action Contract 2
Contract: EP-W-06-004
Task Order: 0130-RSBD-06ZQ

Dear Mr. Miller:

EA Engineering, Science, and Technology, Inc., PBC (EA) is submitting an electronic copy of the Data Validation Report for the above-referenced Task Order associated with the split sampling of sediment material conducted on 23 December 2015.

If you have any questions regarding this document, please call me at (972) 315-3922.

Sincerely,

Brian Yost, CHMM
Project Manager

Enclosure

cc: Michael Pheeny, EPA Contracting Officer (Letter only)
Rena McClurg, EPA Project Officer (Letter only)
Tim Startz, EA Program Manager (Letter only via e-mail)
File

9769515

TRANSMITTAL OF DOCUMENTS FOR ACCEPTANCE BY EPA		DATE: 8 February **2016**	TRANSMITTAL NO.: **0005**
TO: **Mr. Gary Miller** **U.S. Environmental Protection Agency Region 6**		FROM: **Brian Yost** **EA Engineering, Science, and Technology, Inc., PBC**	
SUBTASK NO.	DELIVERABLE		NO. OF COPIES
5.7	San Jacinto River Waste Pits Superfund Site Remedial Investigation/Feasibility Study Oversight Data ValidationReport		1 Portable Document Format (PDF) Version Submitted via E-mail
ACCEPTANCE ACTION			
DOCUMENTS FOUND ACCEPTABLE (LIST BY SUBTASK NO.)		NAME/TITLE/SIGNATURE OF REVIEWER DATE	

DATA VALIDATION REPORT
San Jacinto River Waste Pits Remedial Investigation / Feasibility Study (RI/FS) Oversight December 2015 Sampling Event

Site Name:	San Jacinto River Waste Pits Superfund Site Harris County, Texas
Laboratory:	TestAmerica Laboratories, Inc., West Sacramento, CA
QA Reviewer:	Kim Wallace-Wymore EA Engineering, Science, and Technology, Inc., PBC (EA)
Sample Delivery Group Nos.:	320-16640
Sample Identification:	See Table 1
Matrix:	Sediment
QC Criteria Reviewed:	Section 2.0
Laboratory Report Date:	19 January 2016

1.0 INTRODUCTION

Three sediment samples were collected on 23 December 2015 in support of the San Jacinto River Waste Pits RI/FS Oversight. On 24 December 2015, EA delivered the samples to the TestAmerica Laboratories, Inc. (TA) facility in Houston, TX. The samples were shipped via overnight courier to TA in West Sacramento, CA for preparation and analysis. The respective analytical parameters and testing method are provided below.

- Dioxins and Furans by 40 Code of Federal Regulations, Part 136, Appendix A, Methods for Organic Chemical Analysis of Municipal Industrial Wastewater, Method 1613, Revision B: Tetra- Through Octa-Chlorinated Dioxins and Furans by Isotope Dilution HRGC/HRMS.

The data were validated in accordance with requirements specified in the following documents:

- *EPA-540-R-11-016, Contract Laboratory Program National Functional Guidelines for Chlorinated Dibenzo-p-Dioxins (CDDs) and Chlorinated Dibenzofurans (CDFs) Data Review, 2011*
- *Remedial Investigation/Feasibility Study Oversight Work Plan for San Jacinto River Waste Pits Superfund Site, Harris County, Texas (EA 2015a)*
- *Abbreviated Field Sampling Plan for Remedial Investigation/Feasibility Study Oversight, Harris County, Texas (EA 2015b)*

Section 2.0 of this validation report identifies the criteria reviewed based on U.S. Environmental Protection Agency (EPA) guidelines. Section 3.0 contains the definitions of the qualifiers to be applied to the results based on the outcome of the data validation process. Section 4.0 provides an assessment of the overall data quality, and Section 5.0 provides the references to the guidelines and documents used to perform the review of the data. The Level 2 analytical data package is attached to this report.

Table 1 provides a list of the field sample identification (ID), laboratory sample delivery group (SDG) and sample ID, sample matrix, sample collection date, and analytical method and parameter. The results of these analyses are discussed in Section 4.0, Data Assessment.

2.0 DATA VALIDATION CRITERIA

The criteria listed below were evaluated as part of the validation process, as applicable to the analytical method.

- Deliverable completeness
- Chain of custody and sample receipt
- Holding times
- Window defining mixture (WDM) and chromatographic resolution
- Calibration (initial and continuing)
- Blanks
- Laboratory control sample (LCS)
- Surrogate spike recoveries
- Labeled compound recoveries
- Sample quantitation and reported detection limits
- Target compound identification
- Overall assessment of data

TABLE 1
SAMPLE CROSS-REFERENCE TABLE

Field Sample ID	Laboratory Sample Delivery Group/Sample ID	Matrix	Date Collected	Analytical Method/ Parameters
SD0005-EA-SS	320-16640-1	Sediment	23 December 2015	1613B/Dioxins and Furans
SD0006-EA-SS	320-16640-2	Sediment	23 December 2015	1613B/Dioxins and Furans
SD0009-EA-SS	320-16640-3	Sediment	23 December 2015	1613B/Dioxins and Furans
NOTES: SS – split sample				

3.0 GLOSSARY OF DATA QUALIFIERS

The following definitions provide a brief explanation for the data qualifiers that may be applied to the data during the data review process. The definitions are consistent with EPA guidance (2011).

No Qualifier	Indicates that the data are acceptable both qualitatively and quantitatively.
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample. The data are valid for project use to achieve project data quality objectives (DQOs).
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate. The data are valid for project use to achieve project DQOs.
R	The sample results are not usable to achieve project DQOs based on certain QC criteria outside of acceptance limits. The analyte may or may not be present in the sample.

4.0 DATA ASSESSMENT

The analytical data in SDG 320-16640 were reviewed for the criteria listed in Section 2.0. Additionally, 10 percent of the reported data were reviewed and compared to the laboratory report Form Is and the electronic data deliverable (EDD). A discussion of the data is presented in this section.

4.1 Deliverables

The data package and electronic deliverables for this SDG are complete.

4.2 Chain of Custody and Sample Receipt

The samples were received by TA under appropriate chain of custody, in good condition and properly preserved. The cooler temperature was within the specified EPA guidelines of $\leq$6 degrees Celsius.

4.3 Holding Times

The samples were extracted and analyzed within the method-specific holding times.

4.4 Window Defining Mixture and Chromatographic Resolution

The WDM and Isomer Specificity Check solution were combined in a single Column Performance Solution Mixture (CPSM). The CPSM was analyzed during each 12-hour

analytical sequence as required. The CPSM valley was less than 25 percent in both the DB-5 and DB-225 columns per the resolution check summaries.

4.5 Calibration Criteria

Initial and continuing calibrations were performed at the required frequencies per the analytical method. The results for the target analytes were within the control criteria as specified, unless otherwise noted.

Method 1613B specifies a ±15 second retention time difference between the recovery standard in the initial calibration and continuing calibration verification (CCV). The 13C-1,2,3,4-TCDD recovery standard for the continuing calibration standard CCV 320-98126/2 associated with the following samples analyzed on Instrument 9D2 exceeded this criteria: SD0005-EA-SS (320-16640-1), SD0006-EA-SS (320-16640-2), and SD0009-EA-SS (320-16640-3). According to the case narrative, this retention time shift is due to normal and reasonable column maintenance and does not affect the instrument chromatography resolution, sensitivity, or identification of target analytes and system retention times have been updated for proper analyte identification. The following results were qualified as estimated (J) by the reviewer:

- 2,3,7,8-tetrachlorodibenzofuran (TCDF) in samples SD0005-EA-SS, SD0006-EA-SS, and SD0009-EA-SS.

4.6 Blank Detections

A method blank was prepared and analyzed with the analytical batch containing project samples. No target analytes were detected in the method blank that resulted in the qualification of the sample data. Although detectable concentrations of octachlorodibenzodioxin (OCDD), octachlorodibenzofuran (OCDF), and 1,2,3,4,6,7,8-heptachlorodibenzodioxin (HpCDD) were reported in the associated method blank, the concentrations of these target analytes in the associated samples were more than five times greater than those reported for the method blank. The laboratory-applied B-qualifiers have been removed from the project sample results.

Equipment rinsate blank and field blank samples were not collected in association with this split sampling event.

4.7 Laboratory Control Samples

A laboratory control sample (LCS) was prepared and analyzed as recommended by the analytical method and project requirements. The percent recoveries (%R) were within the method control limits and no data required qualification.

4.8 Surrogate Recoveries

Surrogate spikes were added to the environmental and QC samples, as required. The %R for surrogate compounds were within the method-specific control limits for the project samples and no data required qualification.

4.9 Labeled Compound Recoveries

Labeled compounds were added to the samples as required to monitor instrument sensitivity and response during sample analysis. The internal standard recoveries and retention times were within the method-specific control criteria and no data required qualification.

4.10 Matrix Spike and Matrix Spike Duplicate Samples

Project-specific matrix spike and matrix spike duplicate samples analysis was not requested in association with this split sampling event.

4.11 Field and Laboratory Duplicate Samples

Field duplicate samples were not collected in association with this split sampling event.

4.12 Sample Quantitation and Reported Detection Limits

Project samples were analyzed at the appropriate dilutions to achieve the project-required reporting limits. The results for project samples were reported on a dry-weight basis. Samples required dilution due to elevated concentrations of target analytes in the samples and the reporting limits were adjusted accordingly. Detectable data results below the reporting limit and above the estimated detection limit were J-qualified as estimated values. Non-detectable sample results were reported at the estimated detection limit with a U-qualifier.

Results that were q-qualified indicate the estimated maximum concentration of the analyte, and were quantitated using the theoretical ion ratio; the following results were J-qualified by the reviewer:

- 1,2,3,4,7,8-hexachlorodibenzo-p-dioxin (HxCDD) in sample SD0005-EA-SS;
- 1,2,3,6,7,8-HxCDD in sample SD0006-EA-SS;
- 1,2,3,7,8,9-HxCDD in sample SD0005-EA-SS;
- 1,2,3,7,8,9-hexachlorodibenzofuran (HxCDF) in sample SD0006-EA-SS;
- 2,3,4,6,7,8-HxCDF in samples SD0006-EA-SS and SD0009-EA-SS;
- 2,3,4,7,8-pentachlorodibenzofuran (PeCDF) in sample SD0009-EA-SS;
- Total HxCDD in samples SD0005-EA-SS, SD0006-EA-SS, and SD0009-EA-SS;
- Total HxCDF in samples SD0006-EA-SS and SD0009-EA-SS;
- Total pentachlorodibenzo-p-dioxin (PeCDD) in samples SD0005-EA-SS, SD0006-EA-SS, and SD0009-EA-SS;
- Total PeCDF in samples SD0005-EA-SS, SD0006-EA-SS, and SD0009-EA-SS;
- Total tetrachlorodibenzo-p-dioxin (TCDD) in sample SD0009-EA-SS;
- Total TCDF in samples SD0006-EA-SS and SD0009-EA-SS.

The following issues were noted in the case narrative:

- Sample SD0005-EA-SS exhibited elevated noise or matrix interferences for the analytes 2,3,7,8-TCDD, total TCDD, and total TCDF. The affected results were G-qualified by the laboratory and were qualified as estimated (J) by the reviewer.

- The concentration of compound 2,3,7,8-TCDF exceeded the instrument calibration range in sample SD0005-EA-SS. The result was E-qualified by the laboratory and was qualified as estimated (J) by the reviewer.

The reported sample concentrations for 10 percent of the samples (results for sample SD0005-EA-SS) were verified by comparing the results presented on the Adobe Acrobat™ laboratory report (Form I) to the EDD results. The reported concentrations were consistent in the Form I, and EDD.

4.13 Overall Assessment of Data

Project deliverables were reviewed for completeness and compliance with the project planning documents. Based on the data review, the completeness of deliverables is 100 percent. Data quality criteria exceedances were observed as noted above for calibration, matrix interference, and exceedance of calibration range that required J- and UJ-qualifiers signifying estimated data. Estimated data are usable to achieve project objectives. No analytical data were R-qualified, which signifies rejected or unusable data. The December 2015 dioxin and furan sediment sample data are usable to support the project data quality objectives for the San Jacinto River Waste Pits Superfund Site RI/FS Oversight Project.

REFERENCES

EA Engineering, Science, and Technology, Inc., PBC (EA). 2015a. *Remedial Investigation/Feasibility Study Oversight Work Plan for San Jacinto River Waste Pits Superfund Site, Harris County, Texas.* August.

EA. 2015b. *Abbreviated Field Sampling Plan for Remedial Investigation/Feasibility Study Oversight, San Jacinto River Waste Pits Superfund Site, Harris County, Texas.* December.

U.S. Environmental Protection Agency (EPA). 2011. *USEPA Contract Laboratory Program National Functional Guidelines for Chlorinated Dibenzo-p-dioxins (CDDs) and Chlorinated Dibenzofurans (CDFs) Data Review, EPA-540-R-11-016*. September.

EPA. 1994. *Methods for Organic Chemical Analysis of Municipal Industrial Wastewater, 40CFR Part 136, Appendix A. Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution HRGC/HRMS.* October.

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
Tel: (916)373-5600

TestAmerica Job ID: 320-16640-1
Client Project/Site: San Jacinto River TO 14342130

For:
EA Engineering, Science, and Technology
405 S. Highway 121 bypass
Building C
Suite 100
Lewisville, Texas 75067

Attn: Mr. Brian Yost

Authorized for release by:
1/19/2016 2:32:33 PM

Jill Kellmann, Manager of Project Management
(916)374-4402
jill.kellmann@testamericainc.com

Table of Contents

Qualifiers

Dioxin

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
q	The reported result is the estimated maximum possible concentration of this analyte, quantitated using the theoretical ion ratio. The measured ion ratio does not meet qualitative identification criteria and indicates a possible interference.
G	The reported quantitation limit has been raised due to an exhibited elevated noise or matrix interference
E	Result exceeded calibration range.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 320-16640-1

Laboratory: TestAmerica Sacramento

Narrative

Receipt
The samples were received on 12/29/2015 9:45 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.0º C.

Dioxin
Method(s) 1613B: The following sample exhibited elevated noise or matrix interferences for one or more analytes causing elevation of the detection limit (EDL): SD0005-EA-SS (320-16640-1) . The reporting limit (RL) for the affected analytes has been raised to be equal to the EDL, and a "G" qualifier applied.

EPA Method 1613B specifies a +/- 15 second retention time difference between the recovery standard in the initial calibration (ICAL) and the continuing calibration verification (CCV). The 13C-1,2,3,4-TCDD recovery standard associated with the following samples analyzed on instrument 9D2 exceeded this criteria: SD0005-EA-SS (320-16640-1), SD0006-EA-SS (320-16640-2), SD0009-EA-SS (320-16640-3) and (CCV 320-98126/2). This retention time shift is due to normal and reasonable column maintenance and does not affect the instrument chromatography resolution, sensitivity, or identification of target analytes. System retention times have been updated for proper analyte identification.

The concentration of one or more analytes associated with the following samples exceeded the instrument calibration range: SD0005-EA-SS (320-16640-1). These analytes have been qualified; however, the peaks did not saturate the instrument detector. Historical data indicate that for the isotope dilution method, dilution and re-analysis will not produce significantly different results from those reported above the calibration range.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Dioxin Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Detection Summary

Client: EA Engineering, Science, and Technology
Project/Site: San Jacinto River TO 14342130

TestAmerica Job ID: 320-16640-1

Client Sample ID: SD0005-EA-SS — Lab Sample ID: 320-16640-1

Analyte	Result	Qualifier	RL	EDL	Unit	Dil Fac	D	Method	Prep Type
2,3,7,8-TCDD	26000	G	100	100	pg/g	1	☼	1613B	Total/NA
1,2,3,7,8-PeCDD	170	J	430	3.7	pg/g	1	☼	1613B	Total/NA
1,2,3,7,8-PeCDF	2600		430	23	pg/g	1	☼	1613B	Total/NA
2,3,4,7,8-PeCDF	1600		430	25	pg/g	1	☼	1613B	Total/NA
1,2,3,4,7,8-HxCDD	4.7	J q	430	1.8	pg/g	1	☼	1613B	Total/NA
1,2,3,6,7,8-HxCDD	23	J	430	1.6	pg/g	1	☼	1613B	Total/NA
1,2,3,7,8,9-HxCDD	6.8	J q	430	1.5	pg/g	1	☼	1613B	Total/NA
1,2,3,4,7,8-HxCDF	3800		430	27	pg/g	1	☼	1613B	Total/NA
1,2,3,6,7,8-HxCDF	820		430	26	pg/g	1	☼	1613B	Total/NA
1,2,3,7,8,9-HxCDF	30	J	430	20	pg/g	1	☼	1613B	Total/NA
2,3,4,6,7,8-HxCDF	94	J	430	19	pg/g	1	☼	1613B	Total/NA
1,2,3,4,6,7,8-HpCDD	310	J B	430	8.1	pg/g	1	☼	1613B	Total/NA
1,2,3,4,6,7,8-HpCDF	980		430	14	pg/g	1	☼	1613B	Total/NA
1,2,3,4,7,8,9-HpCDF	320	J	430	21	pg/g	1	☼	1613B	Total/NA
OCDD	5200	B	860	32	pg/g	1	☼	1613B	Total/NA
OCDF	520	J B	860	7.7	pg/g	1	☼	1613B	Total/NA
Total TCDD	28000	G	100	100	pg/g	1	☼	1613B	Total/NA
Total TCDF	160000	G	280	280	pg/g	1	☼	1613B	Total/NA
Total PeCDD	180	J q	430	3.7	pg/g	1	☼	1613B	Total/NA
Total PeCDF	6700	q	430	24	pg/g	1	☼	1613B	Total/NA
Total HxCDD	96	J q	430	1.7	pg/g	1	☼	1613B	Total/NA
Total HxCDF	5300		430	23	pg/g	1	☼	1613B	Total/NA
Total HpCDD	690	B	430	8.1	pg/g	1	☼	1613B	Total/NA
Total HpCDF	1700		430	18	pg/g	1	☼	1613B	Total/NA
2,3,7,8-TCDF - RA	64000	E	86	84	pg/g	1	☼	1613B	Total/NA

Client Sample ID: SD0006-EA-SS — Lab Sample ID: 320-16640-2

Analyte	Result	Qualifier	RL	EDL	Unit	Dil Fac	D	Method	Prep Type
2,3,7,8-TCDD	92		3.4	0.63	pg/g	1	☼	1613B	Total/NA
1,2,3,7,8-PeCDD	1.1	J	17	0.33	pg/g	1	☼	1613B	Total/NA
1,2,3,7,8-PeCDF	7.0	J	17	0.29	pg/g	1	☼	1613B	Total/NA
2,3,4,7,8-PeCDF	6.1	J	17	0.32	pg/g	1	☼	1613B	Total/NA
1,2,3,4,7,8-HxCDD	1.1	J	17	0.40	pg/g	1	☼	1613B	Total/NA
1,2,3,6,7,8-HxCDD	2.3	J q	17	0.37	pg/g	1	☼	1613B	Total/NA
1,2,3,7,8,9-HxCDD	4.2	J	17	0.33	pg/g	1	☼	1613B	Total/NA
1,2,3,4,7,8-HxCDF	8.6	J	17	0.40	pg/g	1	☼	1613B	Total/NA
1,2,3,6,7,8-HxCDF	2.4	J	17	0.34	pg/g	1	☼	1613B	Total/NA
1,2,3,7,8,9-HxCDF	0.68	J q	17	0.28	pg/g	1	☼	1613B	Total/NA
2,3,4,6,7,8-HxCDF	0.98	J q	17	0.28	pg/g	1	☼	1613B	Total/NA
1,2,3,4,6,7,8-HpCDD	100	B	17	3.5	pg/g	1	☼	1613B	Total/NA
1,2,3,4,6,7,8-HpCDF	10	J	17	0.57	pg/g	1	☼	1613B	Total/NA
1,2,3,4,7,8,9-HpCDF	1.4	J	17	0.84	pg/g	1	☼	1613B	Total/NA
OCDD	3400	B	34	17	pg/g	1	☼	1613B	Total/NA
OCDF	95	B	34	0.66	pg/g	1	☼	1613B	Total/NA
Total TCDD	110		3.4	0.63	pg/g	1	☼	1613B	Total/NA
Total TCDF	670	q	3.4	2.5	pg/g	1	☼	1613B	Total/NA
Total PeCDD	11	J q	17	0.33	pg/g	1	☼	1613B	Total/NA
Total PeCDF	26	q	17	0.31	pg/g	1	☼	1613B	Total/NA
Total HxCDD	75	q	17	0.37	pg/g	1	☼	1613B	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: SD0006-EA-SS (Continued)

Lab Sample ID: 320-16640-2

Analyte	Result	Qualifier	RL	EDL	Unit	Dil Fac	D	Method	Prep Type
Total HxCDF	20	q	17	0.32	pg/g	1	☼	1613B	Total/NA
Total HpCDD	360	B	17	3.5	pg/g	1	☼	1613B	Total/NA
Total HpCDF	25		17	0.70	pg/g	1	☼	1613B	Total/NA
2,3,7,8-TCDF - RA	310		3.4	0.68	pg/g	1	☼	1613B	Total/NA

Client Sample ID: SD0009-EA-SS

Lab Sample ID: 320-16640-3

Analyte	Result	Qualifier	RL	EDL	Unit	Dil Fac	D	Method	Prep Type
2,3,7,8-TCDD	37		3.3	0.40	pg/g	1	☼	1613B	Total/NA
1,2,3,7,8-PeCDF	3.0	J	17	0.28	pg/g	1	☼	1613B	Total/NA
2,3,4,7,8-PeCDF	2.1	J q	17	0.31	pg/g	1	☼	1613B	Total/NA
1,2,3,4,7,8-HxCDD	1.2	J	17	0.46	pg/g	1	☼	1613B	Total/NA
1,2,3,6,7,8-HxCDD	2.7	J	17	0.43	pg/g	1	☼	1613B	Total/NA
1,2,3,7,8,9-HxCDD	4.5	J	17	0.38	pg/g	1	☼	1613B	Total/NA
1,2,3,4,7,8-HxCDF	5.1	J	17	0.32	pg/g	1	☼	1613B	Total/NA
1,2,3,6,7,8-HxCDF	1.9	J	17	0.28	pg/g	1	☼	1613B	Total/NA
1,2,3,7,8,9-HxCDF	0.52	J	17	0.22	pg/g	1	☼	1613B	Total/NA
2,3,4,6,7,8-HxCDF	0.61	J q	17	0.21	pg/g	1	☼	1613B	Total/NA
1,2,3,4,6,7,8-HpCDD	130	B	17	4.0	pg/g	1	☼	1613B	Total/NA
1,2,3,4,6,7,8-HpCDF	11	J	17	0.50	pg/g	1	☼	1613B	Total/NA
1,2,3,4,7,8,9-HpCDF	1.5	J	17	0.75	pg/g	1	☼	1613B	Total/NA
OCDD	5100	B	33	22	pg/g	1	☼	1613B	Total/NA
OCDF	120	B	33	0.55	pg/g	1	☼	1613B	Total/NA
Total TCDD	47	q	3.3	0.40	pg/g	1	☼	1613B	Total/NA
Total TCDF	240	q	3.3	0.73	pg/g	1	☼	1613B	Total/NA
Total PeCDD	8.3	J q	17	0.33	pg/g	1	☼	1613B	Total/NA
Total PeCDF	13	J q	17	0.30	pg/g	1	☼	1613B	Total/NA
Total HxCDD	75	q	17	0.42	pg/g	1	☼	1613B	Total/NA
Total HxCDF	17	q	17	0.26	pg/g	1	☼	1613B	Total/NA
Total HpCDD	440	B	17	4.0	pg/g	1	☼	1613B	Total/NA
Total HpCDF	30		17	0.62	pg/g	1	☼	1613B	Total/NA
2,3,7,8-TCDF - RA	120		3.3	0.43	pg/g	1	☼	1613B	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: SD0005-EA-SS

Date Collected: 12/23/15 14:10
Date Received: 12/29/15 09:45

Lab Sample ID: 320-16640-1

Matrix: Solid
Percent Solids: 42.0

Method: 1613B - Dioxins and Furans (HRGC/HRMS)

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDD	26000	G	100	100	pg/g	☼	01/05/16 10:24	01/12/16 20:19	1
1,2,3,7,8-PeCDD	170	J	430	3.7	pg/g	☼	01/05/16 10:24	01/12/16 20:19	1
1,2,3,7,8-PeCDF	2600		430	23	pg/g	☼	01/05/16 10:24	01/12/16 20:19	1
2,3,4,7,8-PeCDF	1600		430	25	pg/g	☼	01/05/16 10:24	01/12/16 20:19	1
1,2,3,4,7,8-HxCDD	4.7	J q	430	1.8	pg/g	☼	01/05/16 10:24	01/12/16 20:19	1
1,2,3,6,7,8-HxCDD	23	J	430	1.6	pg/g	☼	01/05/16 10:24	01/12/16 20:19	1
1,2,3,7,8,9-HxCDD	6.8	J q	430	1.5	pg/g	☼	01/05/16 10:24	01/12/16 20:19	1
1,2,3,4,7,8-HxCDF	3800		430	27	pg/g	☼	01/05/16 10:24	01/12/16 20:19	1
1,2,3,6,7,8-HxCDF	820		430	26	pg/g	☼	01/05/16 10:24	01/12/16 20:19	1
1,2,3,7,8,9-HxCDF	30	J	430	20	pg/g	☼	01/05/16 10:24	01/12/16 20:19	1
2,3,4,6,7,8-HxCDF	94	J	430	19	pg/g	☼	01/05/16 10:24	01/12/16 20:19	1
1,2,3,4,6,7,8-HpCDD	310	J B	430	8.1	pg/g	☼	01/05/16 10:24	01/12/16 20:19	1
1,2,3,4,6,7,8-HpCDF	980		430	14	pg/g	☼	01/05/16 10:24	01/12/16 20:19	1
1,2,3,4,7,8,9-HpCDF	320	J	430	21	pg/g	☼	01/05/16 10:24	01/12/16 20:19	1
OCDD	5200	B	860	32	pg/g	☼	01/05/16 10:24	01/12/16 20:19	1
OCDF	520	J B	860	7.7	pg/g	☼	01/05/16 10:24	01/12/16 20:19	1
Total TCDD	28000	G	100	100	pg/g	☼	01/05/16 10:24	01/12/16 20:19	1
Total TCDF	160000	G	280	280	pg/g	☼	01/05/16 10:24	01/12/16 20:19	1
Total PeCDD	180	J q	430	3.7	pg/g	☼	01/05/16 10:24	01/12/16 20:19	1
Total PeCDF	6700	q	430	24	pg/g	☼	01/05/16 10:24	01/12/16 20:19	1
Total HxCDD	96	J q	430	1.7	pg/g	☼	01/05/16 10:24	01/12/16 20:19	1
Total HxCDF	5300		430	23	pg/g	☼	01/05/16 10:24	01/12/16 20:19	1
Total HpCDD	690	B	430	8.1	pg/g	☼	01/05/16 10:24	01/12/16 20:19	1
Total HpCDF	1700		430	18	pg/g	☼	01/05/16 10:24	01/12/16 20:19	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDD	*83*		*25 - 164*	*01/05/16 10:24*	*01/12/16 20:19*	*1*
13C-2,3,7,8-TCDF	*90*		*24 - 169*	*01/05/16 10:24*	*01/12/16 20:19*	*1*
13C-1,2,3,7,8-PeCDD	*111*		*25 - 181*	*01/05/16 10:24*	*01/12/16 20:19*	*1*
13C-1,2,3,7,8-PeCDF	*99*		*24 - 185*	*01/05/16 10:24*	*01/12/16 20:19*	*1*
13C-2,3,4,7,8-PeCDF	*105*		*21 - 178*	*01/05/16 10:24*	*01/12/16 20:19*	*1*
13C-1,2,3,4,7,8-HxCDD	*94*		*32 - 141*	*01/05/16 10:24*	*01/12/16 20:19*	*1*
13C-1,2,3,6,7,8-HxCDD	*97*		*28 - 130*	*01/05/16 10:24*	*01/12/16 20:19*	*1*
13C-1,2,3,4,7,8-HxCDF	*98*		*26 - 152*	*01/05/16 10:24*	*01/12/16 20:19*	*1*
13C-1,2,3,6,7,8-HxCDF	*92*		*26 - 123*	*01/05/16 10:24*	*01/12/16 20:19*	*1*
13C-1,2,3,7,8,9-HxCDF	*97*		*29 - 147*	*01/05/16 10:24*	*01/12/16 20:19*	*1*
13C-2,3,4,6,7,8-HxCDF	*102*		*28 - 136*	*01/05/16 10:24*	*01/12/16 20:19*	*1*
13C-1,2,3,4,6,7,8-HpCDD	*99*		*23 - 140*	*01/05/16 10:24*	*01/12/16 20:19*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*102*		*28 - 143*	*01/05/16 10:24*	*01/12/16 20:19*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*95*		*26 - 138*	*01/05/16 10:24*	*01/12/16 20:19*	*1*
13C-OCDD	*105*		*17 - 157*	*01/05/16 10:24*	*01/12/16 20:19*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*103*		*35 - 197*	*01/05/16 10:24*	*01/12/16 20:19*	*1*

Method: 1613B - Dioxins and Furans (HRGC/HRMS) - RA

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDF	64000	E	86	84	pg/g	☼	01/05/16 10:24	01/13/16 20:01	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDF	*108*		*24 - 169*	*01/05/16 10:24*	*01/13/16 20:01*	*1*

Client Sample ID: SD0005-EA-SS

Lab Sample ID: 320-16640-1
Date Collected: 12/23/15 14:10
Matrix: Solid
Date Received: 12/29/15 09:45
Percent Solids: 42.0

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	101		35 - 197	01/05/16 10:24	01/13/16 20:01	1

Client Sample ID: SD0006-EA-SS

Lab Sample ID: 320-16640-2
Date Collected: 12/23/15 14:55
Matrix: Solid
Date Received: 12/29/15 09:45
Percent Solids: 28.9

Method: 1613B - Dioxins and Furans (HRGC/HRMS)

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDD	92		3.4	0.63	pg/g	☼	01/05/16 10:24	01/12/16 21:01	1
1,2,3,7,8-PeCDD	1.1	J	17	0.33	pg/g	☼	01/05/16 10:24	01/12/16 21:01	1
1,2,3,7,8-PeCDF	7.0	J	17	0.29	pg/g	☼	01/05/16 10:24	01/12/16 21:01	1
2,3,4,7,8-PeCDF	6.1	J	17	0.32	pg/g	☼	01/05/16 10:24	01/12/16 21:01	1
1,2,3,4,7,8-HxCDD	1.1	J	17	0.40	pg/g	☼	01/05/16 10:24	01/12/16 21:01	1
1,2,3,6,7,8-HxCDD	2.3	J q	17	0.37	pg/g	☼	01/05/16 10:24	01/12/16 21:01	1
1,2,3,7,8,9-HxCDD	4.2	J	17	0.33	pg/g	☼	01/05/16 10:24	01/12/16 21:01	1
1,2,3,4,7,8-HxCDF	8.6	J	17	0.40	pg/g	☼	01/05/16 10:24	01/12/16 21:01	1
1,2,3,6,7,8-HxCDF	2.4	J	17	0.34	pg/g	☼	01/05/16 10:24	01/12/16 21:01	1
1,2,3,7,8,9-HxCDF	0.68	J q	17	0.28	pg/g	☼	01/05/16 10:24	01/12/16 21:01	1
2,3,4,6,7,8-HxCDF	0.98	J q	17	0.28	pg/g	☼	01/05/16 10:24	01/12/16 21:01	1
1,2,3,4,6,7,8-HpCDD	100	B	17	3.5	pg/g	☼	01/05/16 10:24	01/12/16 21:01	1
1,2,3,4,6,7,8-HpCDF	10	J	17	0.57	pg/g	☼	01/05/16 10:24	01/12/16 21:01	1
1,2,3,4,7,8,9-HpCDF	1.4	J	17	0.84	pg/g	☼	01/05/16 10:24	01/12/16 21:01	1
OCDD	3400	B	34	17	pg/g	☼	01/05/16 10:24	01/12/16 21:01	1
OCDF	95	B	34	0.66	pg/g	☼	01/05/16 10:24	01/12/16 21:01	1
Total TCDD	110		3.4	0.63	pg/g	☼	01/05/16 10:24	01/12/16 21:01	1
Total TCDF	670	q	3.4	2.5	pg/g	☼	01/05/16 10:24	01/12/16 21:01	1
Total PeCDD	11	J q	17	0.33	pg/g	☼	01/05/16 10:24	01/12/16 21:01	1
Total PeCDF	26	q	17	0.31	pg/g	☼	01/05/16 10:24	01/12/16 21:01	1
Total HxCDD	75	q	17	0.37	pg/g	☼	01/05/16 10:24	01/12/16 21:01	1
Total HxCDF	20	q	17	0.32	pg/g	☼	01/05/16 10:24	01/12/16 21:01	1
Total HpCDD	360	B	17	3.5	pg/g	☼	01/05/16 10:24	01/12/16 21:01	1
Total HpCDF	25		17	0.70	pg/g	☼	01/05/16 10:24	01/12/16 21:01	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-2,3,7,8-TCDD	67		25 - 164	01/05/16 10:24	01/12/16 21:01	1
13C-2,3,7,8-TCDF	68		24 - 169	01/05/16 10:24	01/12/16 21:01	1
13C-1,2,3,7,8-PeCDD	80		25 - 181	01/05/16 10:24	01/12/16 21:01	1
13C-1,2,3,7,8-PeCDF	76		24 - 185	01/05/16 10:24	01/12/16 21:01	1
13C-2,3,4,7,8-PeCDF	80		21 - 178	01/05/16 10:24	01/12/16 21:01	1
13C-1,2,3,4,7,8-HxCDD	70		32 - 141	01/05/16 10:24	01/12/16 21:01	1
13C-1,2,3,6,7,8-HxCDD	79		28 - 130	01/05/16 10:24	01/12/16 21:01	1
13C-1,2,3,4,7,8-HxCDF	75		26 - 152	01/05/16 10:24	01/12/16 21:01	1
13C-1,2,3,6,7,8-HxCDF	77		26 - 123	01/05/16 10:24	01/12/16 21:01	1
13C-1,2,3,7,8,9-HxCDF	78		29 - 147	01/05/16 10:24	01/12/16 21:01	1
13C-2,3,4,6,7,8-HxCDF	78		28 - 136	01/05/16 10:24	01/12/16 21:01	1
13C-1,2,3,4,6,7,8-HpCDD	77		23 - 140	01/05/16 10:24	01/12/16 21:01	1
13C-1,2,3,4,6,7,8-HpCDF	75		28 - 143	01/05/16 10:24	01/12/16 21:01	1
13C-1,2,3,4,7,8,9-HpCDF	73		26 - 138	01/05/16 10:24	01/12/16 21:01	1
13C-OCDD	85		17 - 157	01/05/16 10:24	01/12/16 21:01	1

Client Sample ID: SD0006-EA-SS

Lab Sample ID: 320-16640-2
Date Collected: 12/23/15 14:55
Matrix: Solid
Date Received: 12/29/15 09:45
Percent Solids: 28.9

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	103		35 - 197	01/05/16 10:24	01/12/16 21:01	1

Method: 1613B - Dioxins and Furans (HRGC/HRMS) - RA

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDF	310		3.4	0.68	pg/g	☼	01/05/16 10:24	01/13/16 19:24	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-2,3,7,8-TCDF	90		24 - 169	01/05/16 10:24	01/13/16 19:24	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	107		35 - 197	01/05/16 10:24	01/13/16 19:24	1

Client Sample ID: SD0009-EA-SS

Lab Sample ID: 320-16640-3
Date Collected: 12/23/15 15:35
Matrix: Solid
Date Received: 12/29/15 09:45
Percent Solids: 29.8

Method: 1613B - Dioxins and Furans (HRGC/HRMS)

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDD	37		3.3	0.40	pg/g	☼	01/05/16 10:24	01/12/16 21:42	1
1,2,3,7,8-PeCDD	ND		17	0.33	pg/g	☼	01/05/16 10:24	01/12/16 21:42	1
1,2,3,7,8-PeCDF	3.0	J	17	0.28	pg/g	☼	01/05/16 10:24	01/12/16 21:42	1
2,3,4,7,8-PeCDF	2.1	J q	17	0.31	pg/g	☼	01/05/16 10:24	01/12/16 21:42	1
1,2,3,4,7,8-HxCDD	1.2	J	17	0.46	pg/g	☼	01/05/16 10:24	01/12/16 21:42	1
1,2,3,6,7,8-HxCDD	2.7	J	17	0.43	pg/g	☼	01/05/16 10:24	01/12/16 21:42	1
1,2,3,7,8,9-HxCDD	4.5	J	17	0.38	pg/g	☼	01/05/16 10:24	01/12/16 21:42	1
1,2,3,4,7,8-HxCDF	5.1	J	17	0.32	pg/g	☼	01/05/16 10:24	01/12/16 21:42	1
1,2,3,6,7,8-HxCDF	1.9	J	17	0.28	pg/g	☼	01/05/16 10:24	01/12/16 21:42	1
1,2,3,7,8,9-HxCDF	0.52	J	17	0.22	pg/g	☼	01/05/16 10:24	01/12/16 21:42	1
2,3,4,6,7,8-HxCDF	0.61	J q	17	0.21	pg/g	☼	01/05/16 10:24	01/12/16 21:42	1
1,2,3,4,6,7,8-HpCDD	130	B	17	4.0	pg/g	☼	01/05/16 10:24	01/12/16 21:42	1
1,2,3,4,6,7,8-HpCDF	11	J	17	0.50	pg/g	☼	01/05/16 10:24	01/12/16 21:42	1
1,2,3,4,7,8,9-HpCDF	1.5	J	17	0.75	pg/g	☼	01/05/16 10:24	01/12/16 21:42	1
OCDD	5100	B	33	22	pg/g	☼	01/05/16 10:24	01/12/16 21:42	1
OCDF	120	B	33	0.55	pg/g	☼	01/05/16 10:24	01/12/16 21:42	1
Total TCDD	47	q	3.3	0.40	pg/g	☼	01/05/16 10:24	01/12/16 21:42	1
Total TCDF	240	q	3.3	0.73	pg/g	☼	01/05/16 10:24	01/12/16 21:42	1
Total PeCDD	8.3	J q	17	0.33	pg/g	☼	01/05/16 10:24	01/12/16 21:42	1
Total PeCDF	13	J q	17	0.30	pg/g	☼	01/05/16 10:24	01/12/16 21:42	1
Total HxCDD	75	q	17	0.42	pg/g	☼	01/05/16 10:24	01/12/16 21:42	1
Total HxCDF	17	q	17	0.26	pg/g	☼	01/05/16 10:24	01/12/16 21:42	1
Total HpCDD	440	B	17	4.0	pg/g	☼	01/05/16 10:24	01/12/16 21:42	1
Total HpCDF	30		17	0.62	pg/g	☼	01/05/16 10:24	01/12/16 21:42	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-2,3,7,8-TCDD	67		25 - 164	01/05/16 10:24	01/12/16 21:42	1
13C-2,3,7,8-TCDF	66		24 - 169	01/05/16 10:24	01/12/16 21:42	1
13C-1,2,3,7,8-PeCDD	81		25 - 181	01/05/16 10:24	01/12/16 21:42	1
13C-1,2,3,7,8-PeCDF	76		24 - 185	01/05/16 10:24	01/12/16 21:42	1
13C-2,3,4,7,8-PeCDF	78		21 - 178	01/05/16 10:24	01/12/16 21:42	1
13C-1,2,3,4,7,8-HxCDD	72		32 - 141	01/05/16 10:24	01/12/16 21:42	1
13C-1,2,3,6,7,8-HxCDD	78		28 - 130	01/05/16 10:24	01/12/16 21:42	1
13C-1,2,3,4,7,8-HxCDF	76		26 - 152	01/05/16 10:24	01/12/16 21:42	1

Client Sample ID: SD0009-EA-SS
Date Collected: 12/23/15 15:35
Date Received: 12/29/15 09:45

Lab Sample ID: 320-16640-3
Matrix: Solid
Percent Solids: 29.8

Method: 1613B - Dioxins and Furans (HRGC/HRMS) (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-1,2,3,6,7,8-HxCDF	74		26 - 123	01/05/16 10:24	01/12/16 21:42	1
13C-1,2,3,7,8,9-HxCDF	76		29 - 147	01/05/16 10:24	01/12/16 21:42	1
13C-2,3,4,6,7,8-HxCDF	79		28 - 136	01/05/16 10:24	01/12/16 21:42	1
13C-1,2,3,4,6,7,8-HpCDD	78		23 - 140	01/05/16 10:24	01/12/16 21:42	1
13C-1,2,3,4,6,7,8-HpCDF	81		28 - 143	01/05/16 10:24	01/12/16 21:42	1
13C-1,2,3,4,7,8,9-HpCDF	75		26 - 138	01/05/16 10:24	01/12/16 21:42	1
13C-OCDD	89		17 - 157	01/05/16 10:24	01/12/16 21:42	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	96		35 - 197	01/05/16 10:24	01/12/16 21:42	1

Method: 1613B - Dioxins and Furans (HRGC/HRMS) - RA

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDF	120		3.3	0.43	pg/g	☼	01/05/16 10:24	01/13/16 18:46	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-2,3,7,8-TCDF	87		24 - 169	01/05/16 10:24	01/13/16 18:46	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	101		35 - 197	01/05/16 10:24	01/13/16 18:46	1

Toxicity Summary

Client: EA Engineering, Science, and Technology
Project/Site: San Jacinto River TO 14342130

TestAmerica Job ID: 320-16640-1

Client Sample ID: SD0005-EA-SS — Lab Sample ID: 320-16640-1

Analyte	Result	Qualifier	NONE	NONE	Unit	WHO 2005 ND = 0 TEF	WHO 2005 ND = 0 TEQ	Method
Total Dioxin/Furan TEQ					pg/g		34000	TEQ

Analyte	Result	Qualifier	RL	EDL	Unit	WHO 2005 ND = 0 TEF	WHO 2005 ND = 0 TEQ	Method
2,3,7,8-TCDD	26000	G	100	100	pg/g	1	26000	1613B
1,2,3,7,8-PeCDD	170	J	430	3.7	pg/g	1	170	1613B
1,2,3,7,8-PeCDF	2600		430	23	pg/g	0.03	78	1613B
2,3,4,7,8-PeCDF	1600		430	25	pg/g	0.3	480	1613B
1,2,3,4,7,8-HxCDD	4.7	J q	430	1.8	pg/g	0.1	0.47	1613B
1,2,3,6,7,8-HxCDD	23	J	430	1.6	pg/g	0.1	2.3	1613B
1,2,3,7,8,9-HxCDD	6.8	J q	430	1.5	pg/g	0.1	0.68	1613B
1,2,3,4,7,8-HxCDF	3800		430	27	pg/g	0.1	380	1613B
1,2,3,6,7,8-HxCDF	820		430	26	pg/g	0.1	82	1613B
1,2,3,7,8,9-HxCDF	30	J	430	20	pg/g	0.1	3.0	1613B
2,3,4,6,7,8-HxCDF	94	J	430	19	pg/g	0.1	9.4	1613B
1,2,3,4,6,7,8-HpCDD	310	J B	430	8.1	pg/g	0.01	3.1	1613B
1,2,3,4,6,7,8-HpCDF	980		430	14	pg/g	0.01	9.8	1613B
1,2,3,4,7,8,9-HpCDF	320	J	430	21	pg/g	0.01	3.2	1613B
OCDD	5200	B	860	32	pg/g	0.0003	1.6	1613B
OCDF	520	J B	860	7.7	pg/g	0.0003	0.16	1613B
2,3,7,8-TCDF - RA	64000	E	86	84	pg/g	0.1	6400	1613B

Client Sample ID: SD0006-EA-SS — Lab Sample ID: 320-16640-2

Analyte	Result	Qualifier	NONE	NONE	Unit	WHO 2005 ND = 0 TEF	WHO 2005 ND = 0 TEQ	Method
Total Dioxin/Furan TEQ					pg/g		130	TEQ

Analyte	Result	Qualifier	RL	EDL	Unit	WHO 2005 ND = 0 TEF	WHO 2005 ND = 0 TEQ	Method
2,3,7,8-TCDD	92		3.4	0.63	pg/g	1	92	1613B
1,2,3,7,8-PeCDD	1.1	J	17	0.33	pg/g	1	1.1	1613B
1,2,3,7,8-PeCDF	7.0	J	17	0.29	pg/g	0.03	0.21	1613B
2,3,4,7,8-PeCDF	6.1	J	17	0.32	pg/g	0.3	1.8	1613B
1,2,3,4,7,8-HxCDD	1.1	J	17	0.40	pg/g	0.1	0.11	1613B
1,2,3,6,7,8-HxCDD	2.3	J q	17	0.37	pg/g	0.1	0.23	1613B
1,2,3,7,8,9-HxCDD	4.2	J	17	0.33	pg/g	0.1	0.42	1613B
1,2,3,4,7,8-HxCDF	8.6	J	17	0.40	pg/g	0.1	0.86	1613B
1,2,3,6,7,8-HxCDF	2.4	J	17	0.34	pg/g	0.1	0.24	1613B
1,2,3,7,8,9-HxCDF	0.68	J q	17	0.28	pg/g	0.1	0.068	1613B
2,3,4,6,7,8-HxCDF	0.98	J q	17	0.28	pg/g	0.1	0.098	1613B
1,2,3,4,6,7,8-HpCDD	100	B	17	3.5	pg/g	0.01	1.0	1613B
1,2,3,4,6,7,8-HpCDF	10	J	17	0.57	pg/g	0.01	0.10	1613B

TEF Reference:
WHO 2005 = World Health Organization (WHO) 2005 TEF, Dioxins, Furans and PCB Congeners

Client Sample ID: SD0006-EA-SS (Continued)

Lab Sample ID: 320-16640-2

Analyte	Result	Qualifier	RL	EDL	Unit	WHO 2005 ND = 0 TEF	WHO 2005 ND = 0 TEQ	Method
1,2,3,4,7,8,9-HpCDF	1.4	J	17	0.84	pg/g	0.01	0.014	1613B
OCDD	3400	B	34	17	pg/g	0.0003	1.0	1613B
OCDF	95	B	34	0.66	pg/g	0.0003	0.029	1613B
2,3,7,8-TCDF - RA	310		3.4	0.68	pg/g	0.1	31	1613B

Client Sample ID: SD0009-EA-SS

Lab Sample ID: 320-16640-3

Analyte	Result	Qualifier	NONE	NONE	Unit	WHO 2005 ND = 0 TEF	WHO 2005 ND = 0 TEQ	Method
Total Dioxin/Furan TEQ					pg/g		54	TEQ

Analyte	Result	Qualifier	RL	EDL	Unit	WHO 2005 ND = 0 TEF	WHO 2005 ND = 0 TEQ	Method
2,3,7,8-TCDD	37		3.3	0.40	pg/g	1	37	1613B
1,2,3,7,8-PeCDD	ND		17	0.33	pg/g	1	0.00	1613B
1,2,3,7,8-PeCDF	3.0	J	17	0.28	pg/g	0.03	0.090	1613B
2,3,4,7,8-PeCDF	2.1	J q	17	0.31	pg/g	0.3	0.63	1613B
1,2,3,4,7,8-HxCDD	1.2	J	17	0.46	pg/g	0.1	0.12	1613B
1,2,3,6,7,8-HxCDD	2.7	J	17	0.43	pg/g	0.1	0.27	1613B
1,2,3,7,8,9-HxCDD	4.5	J	17	0.38	pg/g	0.1	0.45	1613B
1,2,3,4,7,8-HxCDF	5.1	J	17	0.32	pg/g	0.1	0.51	1613B
1,2,3,6,7,8-HxCDF	1.9	J	17	0.28	pg/g	0.1	0.19	1613B
1,2,3,7,8,9-HxCDF	0.52	J	17	0.22	pg/g	0.1	0.052	1613B
2,3,4,6,7,8-HxCDF	0.61	J q	17	0.21	pg/g	0.1	0.061	1613B
1,2,3,4,6,7,8-HpCDD	130	B	17	4.0	pg/g	0.01	1.3	1613B
1,2,3,4,6,7,8-HpCDF	11	J	17	0.50	pg/g	0.01	0.11	1613B
1,2,3,4,7,8,9-HpCDF	1.5	J	17	0.75	pg/g	0.01	0.015	1613B
OCDD	5100	B	33	22	pg/g	0.0003	1.5	1613B
OCDF	120	B	33	0.55	pg/g	0.0003	0.036	1613B
2,3,7,8-TCDF - RA	120		3.3	0.43	pg/g	0.1	12	1613B

TEF Reference:
WHO 2005 = World Health Organization (WHO) 2005 TEF, Dioxins, Furans and PCB Congeners

Surrogate Summary

Client: EA Engineering, Science, and Technology
Project/Site: San Jacinto River TO 14342130

TestAmerica Job ID: 320-16640-1

Method: 1613B - Dioxins and Furans (HRGC/HRMS)

Matrix: Solid **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)								
Lab Sample ID	Client Sample ID	37TCDD (35-197)								
320-16640-1	SD0005-EA-SS	103								
320-16640-1 - RA	SD0005-EA-SS	101								
320-16640-2	SD0006-EA-SS	103								
320-16640-2 - RA	SD0006-EA-SS	107								
320-16640-3	SD0009-EA-SS	96								
320-16640-3 - RA	SD0009-EA-SS	101								
LCS 320-97294/2-A	Lab Control Sample	99								
MB 320-97294/1-A	Method Blank	104								

Surrogate Legend

37TCDD = 37Cl4-2,3,7,8-TCDD

Isotope Dilution Summary

Client: EA Engineering, Science, and Technology
Project/Site: San Jacinto River TO 14342130

TestAmerica Job ID: 320-16640-1

Method: 1613B - Dioxins and Furans (HRGC/HRMS)

Matrix: Solid **Prep Type: Total/NA**

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	TCDD (25-164)	TCDF (24-169)	PeCDD (25-181)	PeCDF1 (24-185)	PeCDF2 (21-178)	HxCDD1 (32-141)	HxCDD2 (28-130)	HxCDF1 (26-152)
320-16640-1	SD0005-EA-SS	83	90	111	99	105	94	97	98
320-16640-1 - RA	SD0005-EA-SS		108						
320-16640-2	SD0006-EA-SS	67	68	80	76	80	70	79	75
320-16640-2 - RA	SD0006-EA-SS		90						
320-16640-3	SD0009-EA-SS	67	66	81	76	78	72	78	76
320-16640-3 - RA	SD0009-EA-SS		87						
MB 320-97294/1-A	Method Blank	59	66	67	66	67	62	73	65

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	HxCDF2 (26-123)	HxCDF4 (29-147)	HxCDF3 (28-136)	HpCDD (23-140)	HpCDF1 (28-143)	HpCDF2 (26-138)	OCDD (17-157)	HxCDF1 (26-152)
320-16640-1	SD0005-EA-SS	92	97	102	99	102	95	105	98
320-16640-1 - RA	SD0005-EA-SS								
320-16640-2	SD0006-EA-SS	77	78	78	77	75	73	85	75
320-16640-2 - RA	SD0006-EA-SS								
320-16640-3	SD0009-EA-SS	74	76	79	78	81	75	89	76
320-16640-3 - RA	SD0009-EA-SS								
MB 320-97294/1-A	Method Blank	68	67	72	70	71	66	71	65

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	HxCDF2 (21-159)	HxCDF2 (26-123)	HxCDF4 (17-205)	HxCDF4 (29-147)	HxCDF3 (22-176)	HxCDF3 (28-136)	HpCDD (23-140)	HpCDD (26-166)
320-16640-1	SD0005-EA-SS		92		97		102	99	
320-16640-1 - RA	SD0005-EA-SS								
320-16640-2	SD0006-EA-SS		77		78		78	77	
320-16640-2 - RA	SD0006-EA-SS								
320-16640-3	SD0009-EA-SS		74		76		79	78	
320-16640-3 - RA	SD0009-EA-SS								
MB 320-97294/1-A	Method Blank		68		67		72	70	

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	HpCDF1 (21-158)	HpCDF1 (28-143)	HpCDF2 (20-186)	HpCDF2 (26-138)	OCDD (13-199)	OCDD (17-157)		
320-16640-1	SD0005-EA-SS		102		95		105		
320-16640-1 - RA	SD0005-EA-SS								
320-16640-2	SD0006-EA-SS		75		73		85		
320-16640-2 - RA	SD0006-EA-SS								
320-16640-3	SD0009-EA-SS		81		75		89		
320-16640-3 - RA	SD0009-EA-SS								
MB 320-97294/1-A	Method Blank		71		66		71		

Surrogate Legend

TCDD = 13C-2,3,7,8-TCDD
TCDF = 13C-2,3,7,8-TCDF
PeCDD = 13C-1,2,3,7,8-PeCDD
PeCDF1 = 13C-1,2,3,7,8-PeCDF
PeCDF2 = 13C-2,3,4,7,8-PeCDF
HxCDD1 = 13C-1,2,3,4,7,8-HxCDD
HxCDD2 = 13C-1,2,3,6,7,8-HxCDD
HxCDF1 = 13C-1,2,3,4,7,8-HxCDF
HxCDF2 = 13C-1,2,3,6,7,8-HxCDF
HxCDF4 = 13C-1,2,3,7,8,9-HxCDF

HxCDF3 = 13C-2,3,4,6,7,8-HxCDF
HpCDD = 13C-1,2,3,4,6,7,8-HpCDD
HpCDF1 = 13C-1,2,3,4,6,7,8-HpCDF
HpCDF2 = 13C-1,2,3,4,7,8,9-HpCDF
OCDD = 13C-OCDD

Method: 1613B - Dioxins and Furans (HRGC/HRMS)

Matrix: Solid **Prep Type: Total/NA**

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	TCDD (20-175)	TCDF (22-152)	PeCDD (21-227)	PeCDF1 (21-192)	PeCDF2 (13-328)	HxCDD1 (21-193)	HxCDD2 (25-163)	HxCDF1 (19-202)
LCS 320-97294/2-A	Lab Control Sample	56	58	63	59	61	56	67	61

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	HxCDF2 (21-159)	HxCDF4 (17-205)	HxCDF3 (22-176)	HpCDD (26-166)	HpCDF1 (21-158)	HpCDF2 (20-186)	OCDD (13-199)	
LCS 320-97294/2-A	Lab Control Sample	65	64	66	66	69	63	70	

Surrogate Legend

TCDD = 13C-2,3,7,8-TCDD
TCDF = 13C-2,3,7,8-TCDF
PeCDD = 13C-1,2,3,7,8-PeCDD
PeCDF1 = 13C-1,2,3,7,8-PeCDF
PeCDF2 = 13C-2,3,4,7,8-PeCDF
HxCDD1 = 13C-1,2,3,4,7,8-HxCDD
HxCDD2 = 13C-1,2,3,6,7,8-HxCDD
HxCDF1 = 13C-1,2,3,4,7,8-HxCDF
HxCDF2 = 13C-1,2,3,6,7,8-HxCDF
HxCDF4 = 13C-1,2,3,7,8,9-HxCDF
HxCDF3 = 13C-2,3,4,6,7,8-HxCDF
HpCDD = 13C-1,2,3,4,6,7,8-HpCDD
HpCDF1 = 13C-1,2,3,4,6,7,8-HpCDF
HpCDF2 = 13C-1,2,3,4,7,8,9-HpCDF
OCDD = 13C-OCDD

Method: 1613B - Dioxins and Furans (HRGC/HRMS)

Lab Sample ID: MB 320-97294/1-A
Matrix: Solid
Analysis Batch: 97971

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 97294

Analyte	MB Result	MB Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDD	ND		1.0	0.033	pg/g		01/05/16 10:24	01/12/16 18:55	1
2,3,7,8-TCDF	ND		1.0	0.024	pg/g		01/05/16 10:24	01/12/16 18:55	1
1,2,3,7,8-PeCDD	ND		5.0	0.030	pg/g		01/05/16 10:24	01/12/16 18:55	1
1,2,3,7,8-PeCDF	ND		5.0	0.041	pg/g		01/05/16 10:24	01/12/16 18:55	1
2,3,4,7,8-PeCDF	ND		5.0	0.044	pg/g		01/05/16 10:24	01/12/16 18:55	1
1,2,3,4,7,8-HxCDD	ND		5.0	0.021	pg/g		01/05/16 10:24	01/12/16 18:55	1
1,2,3,6,7,8-HxCDD	ND		5.0	0.019	pg/g		01/05/16 10:24	01/12/16 18:55	1
1,2,3,7,8,9-HxCDD	ND		5.0	0.017	pg/g		01/05/16 10:24	01/12/16 18:55	1
1,2,3,4,7,8-HxCDF	ND		5.0	0.058	pg/g		01/05/16 10:24	01/12/16 18:55	1
1,2,3,6,7,8-HxCDF	ND		5.0	0.049	pg/g		01/05/16 10:24	01/12/16 18:55	1
1,2,3,7,8,9-HxCDF	ND		5.0	0.041	pg/g		01/05/16 10:24	01/12/16 18:55	1
2,3,4,6,7,8-HxCDF	ND		5.0	0.037	pg/g		01/05/16 10:24	01/12/16 18:55	1
1,2,3,4,6,7,8-HpCDD	0.0807	J	5.0	0.020	pg/g		01/05/16 10:24	01/12/16 18:55	1
1,2,3,4,6,7,8-HpCDF	ND		5.0	0.067	pg/g		01/05/16 10:24	01/12/16 18:55	1
1,2,3,4,7,8,9-HpCDF	ND		5.0	0.10	pg/g		01/05/16 10:24	01/12/16 18:55	1
OCDD	0.259	J	10	0.027	pg/g		01/05/16 10:24	01/12/16 18:55	1
OCDF	0.579	J	10	0.096	pg/g		01/05/16 10:24	01/12/16 18:55	1
Total TCDD	ND		1.0	0.033	pg/g		01/05/16 10:24	01/12/16 18:55	1
Total TCDF	ND		1.0	0.024	pg/g		01/05/16 10:24	01/12/16 18:55	1
Total PeCDD	ND		5.0	0.030	pg/g		01/05/16 10:24	01/12/16 18:55	1
Total PeCDF	ND		5.0	0.044	pg/g		01/05/16 10:24	01/12/16 18:55	1
Total HxCDD	ND		5.0	0.021	pg/g		01/05/16 10:24	01/12/16 18:55	1
Total HxCDF	ND		5.0	0.058	pg/g		01/05/16 10:24	01/12/16 18:55	1
Total HpCDD	0.191	J	5.0	0.020	pg/g		01/05/16 10:24	01/12/16 18:55	1
Total HpCDF	ND		5.0	0.10	pg/g		01/05/16 10:24	01/12/16 18:55	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDD	*59*		*25 - 164*	*01/05/16 10:24*	*01/12/16 18:55*	*1*
13C-2,3,7,8-TCDF	*66*		*24 - 169*	*01/05/16 10:24*	*01/12/16 18:55*	*1*
13C-1,2,3,7,8-PeCDD	*67*		*25 - 181*	*01/05/16 10:24*	*01/12/16 18:55*	*1*
13C-1,2,3,7,8-PeCDF	*66*		*24 - 185*	*01/05/16 10:24*	*01/12/16 18:55*	*1*
13C-2,3,4,7,8-PeCDF	*67*		*21 - 178*	*01/05/16 10:24*	*01/12/16 18:55*	*1*
13C-1,2,3,4,7,8-HxCDD	*62*		*32 - 141*	*01/05/16 10:24*	*01/12/16 18:55*	*1*
13C-1,2,3,6,7,8-HxCDD	*73*		*28 - 130*	*01/05/16 10:24*	*01/12/16 18:55*	*1*
13C-1,2,3,4,7,8-HxCDF	*65*		*26 - 152*	*01/05/16 10:24*	*01/12/16 18:55*	*1*
13C-1,2,3,6,7,8-HxCDF	*68*		*26 - 123*	*01/05/16 10:24*	*01/12/16 18:55*	*1*
13C-1,2,3,7,8,9-HxCDF	*67*		*29 - 147*	*01/05/16 10:24*	*01/12/16 18:55*	*1*
13C-2,3,4,6,7,8-HxCDF	*72*		*28 - 136*	*01/05/16 10:24*	*01/12/16 18:55*	*1*
13C-1,2,3,4,6,7,8-HpCDD	*70*		*23 - 140*	*01/05/16 10:24*	*01/12/16 18:55*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*71*		*28 - 143*	*01/05/16 10:24*	*01/12/16 18:55*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*66*		*26 - 138*	*01/05/16 10:24*	*01/12/16 18:55*	*1*
13C-OCDD	*71*		*17 - 157*	*01/05/16 10:24*	*01/12/16 18:55*	*1*

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*104*		*35 - 197*	*01/05/16 10:24*	*01/12/16 18:55*	*1*

Method: 1613B - Dioxins and Furans (HRGC/HRMS) (Continued)

Lab Sample ID: LCS 320-97294/2-A
Matrix: Solid
Analysis Batch: 97971

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 97294

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
2,3,7,8-TCDD	20.0	19.4		pg/g		97	67 - 158
2,3,7,8-TCDF	20.0	19.1		pg/g		95	75 - 158
1,2,3,7,8-PeCDD	100	96.7		pg/g		97	70 - 142
1,2,3,7,8-PeCDF	100	104		pg/g		104	80 - 134
2,3,4,7,8-PeCDF	100	104		pg/g		104	68 - 160
1,2,3,4,7,8-HxCDD	100	114		pg/g		114	70 - 164
1,2,3,6,7,8-HxCDD	100	104		pg/g		104	76 - 134
1,2,3,7,8,9-HxCDD	100	104		pg/g		104	64 - 162
1,2,3,4,7,8-HxCDF	100	109		pg/g		109	72 - 134
1,2,3,6,7,8-HxCDF	100	105		pg/g		105	84 - 130
1,2,3,7,8,9-HxCDF	100	107		pg/g		107	78 - 130
2,3,4,6,7,8-HxCDF	100	106		pg/g		106	70 - 156
1,2,3,4,6,7,8-HpCDD	100	104		pg/g		104	70 - 140
1,2,3,4,6,7,8-HpCDF	100	102		pg/g		102	82 - 122
1,2,3,4,7,8,9-HpCDF	100	108		pg/g		108	78 - 138
OCDD	200	188		pg/g		94	78 - 144
OCDF	200	185		pg/g		93	63 - 170

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C-2,3,7,8-TCDD	*56*		*20 - 175*
13C-2,3,7,8-TCDF	*58*		*22 - 152*
13C-1,2,3,7,8-PeCDD	*63*		*21 - 227*
13C-1,2,3,7,8-PeCDF	*59*		*21 - 192*
13C-2,3,4,7,8-PeCDF	*61*		*13 - 328*
13C-1,2,3,4,7,8-HxCDD	*56*		*21 - 193*
13C-1,2,3,6,7,8-HxCDD	*67*		*25 - 163*
13C-1,2,3,4,7,8-HxCDF	*61*		*19 - 202*
13C-1,2,3,6,7,8-HxCDF	*65*		*21 - 159*
13C-1,2,3,7,8,9-HxCDF	*64*		*17 - 205*
13C-2,3,4,6,7,8-HxCDF	*66*		*22 - 176*
13C-1,2,3,4,6,7,8-HpCDD	*66*		*26 - 166*
13C-1,2,3,4,6,7,8-HpCDF	*69*		*21 - 158*
13C-1,2,3,4,7,8,9-HpCDF	*63*		*20 - 186*
13C-OCDD	*70*		*13 - 199*

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
37Cl4-2,3,7,8-TCDD	*99*		*35 - 197*

Specialty Organics

Prep Batch: 97294

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-16640-1	SD0005-EA-SS	Total/NA	Solid	HRMS-Sox	
320-16640-1 - RA	SD0005-EA-SS	Total/NA	Solid	HRMS-Sox	
320-16640-2	SD0006-EA-SS	Total/NA	Solid	HRMS-Sox	
320-16640-2 - RA	SD0006-EA-SS	Total/NA	Solid	HRMS-Sox	
320-16640-3	SD0009-EA-SS	Total/NA	Solid	HRMS-Sox	
320-16640-3 - RA	SD0009-EA-SS	Total/NA	Solid	HRMS-Sox	
LCS 320-97294/2-A	Lab Control Sample	Total/NA	Solid	HRMS-Sox	
MB 320-97294/1-A	Method Blank	Total/NA	Solid	HRMS-Sox	

Analysis Batch: 97971

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-16640-1	SD0005-EA-SS	Total/NA	Solid	1613B	97294
320-16640-2	SD0006-EA-SS	Total/NA	Solid	1613B	97294
320-16640-3	SD0009-EA-SS	Total/NA	Solid	1613B	97294
LCS 320-97294/2-A	Lab Control Sample	Total/NA	Solid	1613B	97294
MB 320-97294/1-A	Method Blank	Total/NA	Solid	1613B	97294

Analysis Batch: 98126

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-16640-1 - RA	SD0005-EA-SS	Total/NA	Solid	1613B	97294
320-16640-2 - RA	SD0006-EA-SS	Total/NA	Solid	1613B	97294
320-16640-3 - RA	SD0009-EA-SS	Total/NA	Solid	1613B	97294

General Chemistry

Analysis Batch: 97206

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-16640-1	SD0005-EA-SS	Total/NA	Solid	D 2216	

Analysis Batch: 97232

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-16640-2	SD0006-EA-SS	Total/NA	Solid	D 2216	
320-16640-3	SD0009-EA-SS	Total/NA	Solid	D 2216	

Client Sample ID: SD0005-EA-SS — **Lab Sample ID: 320-16640-1**
Date Collected: 12/23/15 14:10 — **Matrix: Solid**
Date Received: 12/29/15 09:45

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			97206	01/04/16 13:20	JMD	TAL SAC

Client Sample ID: SD0005-EA-SS — **Lab Sample ID: 320-16640-1**
Date Collected: 12/23/15 14:10 — **Matrix: Solid**
Date Received: 12/29/15 09:45 — **Percent Solids: 42.0**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox			9.89 g	714.3 uL	97294	01/05/16 10:24	DXD	TAL SAC
Total/NA	Analysis	1613B		1	9.89 g	714.3 uL	97971	01/12/16 20:19	SMA	TAL SAC
Total/NA	Prep	HRMS-Sox	RA		9.89 g	714.3 uL	97294	01/05/16 10:24	DXD	TAL SAC
Total/NA	Analysis	1613B	RA	1	9.89 g	714.3 uL	98126	01/13/16 20:01	KSS	TAL SAC

Client Sample ID: SD0006-EA-SS — **Lab Sample ID: 320-16640-2**
Date Collected: 12/23/15 14:55 — **Matrix: Solid**
Date Received: 12/29/15 09:45

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			97232	01/04/16 15:05	JMD	TAL SAC

Client Sample ID: SD0006-EA-SS — **Lab Sample ID: 320-16640-2**
Date Collected: 12/23/15 14:55 — **Matrix: Solid**
Date Received: 12/29/15 09:45 — **Percent Solids: 28.9**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox			10.25 g	20 uL	97294	01/05/16 10:24	DXD	TAL SAC
Total/NA	Analysis	1613B		1	10.25 g	20 uL	97971	01/12/16 21:01	SMA	TAL SAC
Total/NA	Prep	HRMS-Sox	RA		10.25 g	20 uL	97294	01/05/16 10:24	DXD	TAL SAC
Total/NA	Analysis	1613B	RA	1	10.25 g	20 uL	98126	01/13/16 19:24	KSS	TAL SAC

Client Sample ID: SD0009-EA-SS — **Lab Sample ID: 320-16640-3**
Date Collected: 12/23/15 15:35 — **Matrix: Solid**
Date Received: 12/29/15 09:45

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			97232	01/04/16 15:05	JMD	TAL SAC

Client Sample ID: SD0009-EA-SS — **Lab Sample ID: 320-16640-3**
Date Collected: 12/23/15 15:35 — **Matrix: Solid**
Date Received: 12/29/15 09:45 — **Percent Solids: 29.8**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox			10.08 g	20 uL	97294	01/05/16 10:24	DXD	TAL SAC

Lab Chronicle

Client: EA Engineering, Science, and Technology
Project/Site: San Jacinto River TO 14342130

TestAmerica Job ID: 320-16640-1

Client Sample ID: SD0009-EA-SS
Date Collected: 12/23/15 15:35
Date Received: 12/29/15 09:45

Lab Sample ID: 320-16640-3
Matrix: Solid
Percent Solids: 29.8

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	1613B		1	10.08 g	20 uL	97971	01/12/16 21:42	SMA	TAL SAC
Total/NA	Prep	HRMS-Sox	RA		10.08 g	20 uL	97294	01/05/16 10:24	DXD	TAL SAC
Total/NA	Analysis	1613B	RA	1	10.08 g	20 uL	98126	01/13/16 18:46	KSS	TAL SAC

Laboratory References:

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Certification Summary

Client: EA Engineering, Science, and Technology
Project/Site: San Jacinto River TO 14342130

TestAmerica Job ID: 320-16640-1

Laboratory: TestAmerica Sacramento

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Texas	NELAP	6	T104704399-15-9	05-31-16

Method Summary

Client: EA Engineering, Science, and Technology
Project/Site: San Jacinto River TO 14342130

TestAmerica Job ID: 320-16640-1

Method	Method Description	Protocol	Laboratory
1613B	Dioxins and Furans (HRGC/HRMS)	40CFR136A	TAL SAC
D 2216	Percent Moisture	ASTM	TAL SAC

Protocol References:

40CFR136A = "Methods for Organic Chemical Analysis of Municipal Industrial Wastewater", 40CFR, Part 136, Appendix A, October 26, 1984 and subsequent revisions.
ASTM = ASTM International

Laboratory References:

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Sample Summary

Client: EA Engineering, Science, and Technology
Project/Site: San Jacinto River TO 14342130

TestAmerica Job ID: 320-16640-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-16640-1	SD0005-EA-SS	Solid	12/23/15 14:10	12/29/15 09:45
320-16640-2	SD0006-EA-SS	Solid	12/23/15 14:55	12/29/15 09:45
320-16640-3	SD0009-EA-SS	Solid	12/23/15 15:35	12/29/15 09:45

TestAmerica Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
Phone (916) 373-5600 Fax (916) 372-1059

Chain of Custody Record

320-16640 Chain of Custody

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: John Bonner	Lab PM:	COC No: 320-10235-2221 1
Client Contact: Mr Brian Yost	Phone: 281-435-1638	E-Mail:	Page: Page 1 of 1
Company: EA Engineering, Science, and Technology			Job #
Address: 405 S Highway 121 bypass Building C Suite 100	Due Date Requested:		
City: Lewisville	TAT Requested (days): Standard		
State, Zip: TX, 75067	PO #: 14790		
Phone: 972-315-3922	WO #:		
Email: byost@eaest com	Project #: 14342130/B/3		
Project Name: San Jacinto River Waste Pits	SSOW#:		
Site			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	Dioxins + Furans EPA 1613B	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
SD0005-EA-SS	12/23/15	1410		Solid			X		*Concentrations may be greater than 1 ppb
SD0006-EA-SS	12/23/15	1455		Solid			X		
SD0009-EA-SS	12/23/15	1535		Solid			X		
				Solid					Please call prior to running
				Solid					Brian Yost
									972-315-3922

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements

Empty Kit Relinquished by	Date	Time	Method of Shipment
Relinquished by: John T. Bonner	Date/Time: 12/24/15 1009	Company	Received by:	Date/Time: 12-24-15 1009	Company: TA
Relinquished by:	Date/Time: 12-28-15 1500	Company	Received by:	Date/Time: 12/29/15 945	Company
Relinquished by	Date/Time	Company	Received by	Date/Time	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.

Cooler Temperature(s) °C and Other Remarks: 2.0

Login Sample Receipt Checklist

Client: EA Engineering, Science, and Technology

Job Number: 320-16640-1

Login Number: 16640
List Number: 1
Creator: Nelson, Kym D

List Source: TestAmerica Sacramento

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	